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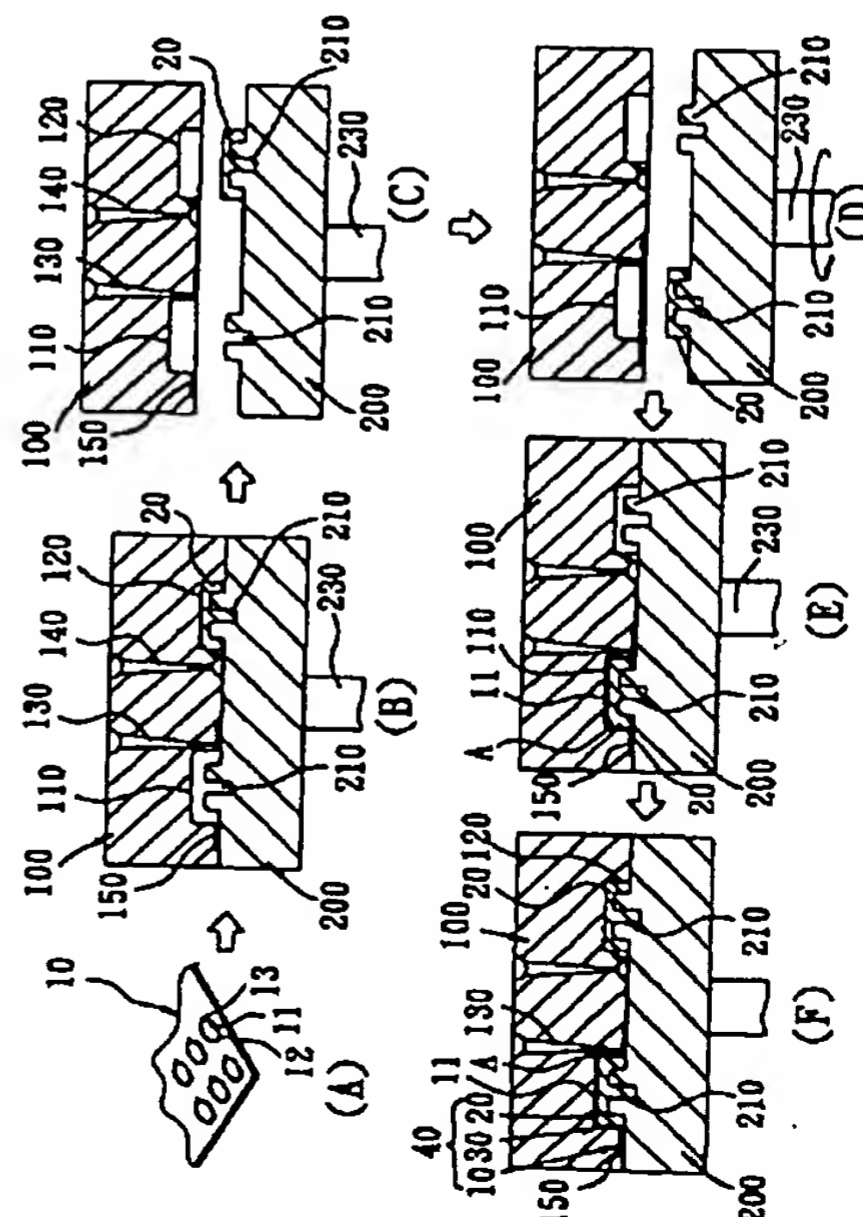
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(54)【発明の名称】 キー・トップ成型方法

(57)【要約】

【課題】 基材に印刷された文字、図案が成型によって変形することのないキー・トップ成型方法を提供する。

【解決手段】 文字、図案が印刷された片状素材(11)を設けた基材(10)を準備し、固定金型(100)と移動金型(200)とを閉じさせて内シェル(20)の射出成型を行い、型を開いて移動金型(200)を180度回転移動させて、基材(10)を内シェル(20)と対応する外シェル成形キャビティ(110)開口に載置して、移動金型(200)と固定金型(100)とを再開し、且つ内シェル(20)により片状素材(11)を押抜き切断して外シェル成形キャビティ(110)内に滞留させ、射出装置により外シェル(30)を成型して、外シェル(30)、内シェル(20)、片状素材(11)を一体に連結して文字、図案を備えたレター・キーのキー・トップ(40)を仕上げる。



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【特許請求の範囲】

【請求項1】 a) 文字、図案が印刷され、それぞれ周縁に環状の目打ちを備えた多数の片状素材が形成されているプラスチックシートの基材を予め準備する工程と、
 b) 固定金型と移動金型とを準備して、この固定金型の両側辺寄りの対称部位にそれぞれセットの外シェル成形キャビティと内シェル成形キャビティとを設け、これら外シェル成形キャビティを前記内シェル成形キャビティよりも大きくし、前記移動金型の各外シェル成形キャビティと各内シェル成形キャビティとが対応する部位にそれぞれセットをなす定位部を設ける工程と、
 c) 前記移動金型と前記固定金型とを閉じ合せて、前記定位部をそれぞれ前記外シェル成形キャビティと前記内シェル成形キャビティの内部とに位置付け、射出装置によりプラスチック原料を前記内シェル成形キャビティの内に導入して内シェルを形成する工程と、
 d) 前記移動金型を前記固定金型から移動して離脱させ、前記内シェルをそのまま前記定位部に滞留定位させる工程と、
 e) 前記移動金型を180度回転移動して、前記定位部の上にある前記内シェルを前記外シェル成形キャビティに対応させて、他のセットの定位部を前記内シェル成形キャビティに対応させ、且つ前記基材を前記固定金型の前記外シェル成形キャビティの開口部位に載置させて、各片状素材をそれぞれ各外シェル成形キャビティと各内シェルとに対応させる工程と、
 f) 前記移動金型を再び前記固定金型に閉じ合せて、この際、前記内シェルが直接前記基材を押圧し、前記片状素材の周縁に目打ちが設けられていることから、前記片状素材が前記内シェルの押圧により押し抜かれて、前記基材と分離して前記外シェル成形キャビティの内部に押し遣られ、前記内シェルの周面と前記外シェル成形キャビティの内周面との間に隙間が生ずる工程と、
 g) 射出装置によりプラスチック原料をそれぞれ前記外シェル成形キャビティの内部と前記内シェル成形キャビティの内部とに注入して、前記隙間内で外シェルを形成すると同時に、前記内シェル成形キャビティの内部でもう一つの内シェルを形成させ、前記外シェルが前記片状素材と前記内シェルと一体に結合し、前記外シェルの下端縁も前記外シェル成形キャビティの周縁沿いに設けられた凹陥部内の前記基材と一体に結合する工程と、
 h) 前記移動金型と前記固定金型を分離して、そのうちのセットの前記定位部からレター・キーのキー・トップ製品を取出し、他のセットの前記定位部に前記内シェルを滞留定位させる工程と、
 i) 前記工程e)～h)を反覆する工程と、
 を順に行ってなるキー・トップ成型方法。

【請求項2】 前記内シェル成形キャビティの奥側端面と内周面との接続部位に多数の突起部を設けて、前記内シェルを成型完了した後に、前記内シェルの上端面に多

数の凹み溝を形成し、且つ前記外シェルを成型する際に、プラスチック原料の一部が凹み溝内に流入して多数の結合部を形成し、これにより前記内シェルと前記外シェルとの結合をより強化させるようにしてなる請求項1に記載のキー・トップ成型方法。

【請求項3】 前記内シェルを透明な材料で形成して、前記片状素材の文字、図案の部位が透明なカラー印刷であり、その他の部分が不透明である請求項1もしくは2に記載のキー・トップ成型方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明はレター・キーの製造方法に関し、特に各種字形、サイズのキー・トップ成型方法に関する。

【0002】

【従来の技術】一般にコンピュータ・キーボードのキー、電話機の番号キー、或いは計算機の操作キー…などのキー・トップは、それぞれ文字や記号、図案を付けて、識別や操作が便利であるように図っている。従来例のキー・トップ成型方法（台湾專利公報第311116号）は、図5に示すように、先ず基材1の背面に濃い地色2を印刷して、図案や文字層を印刷する部位は空白にして残し、次にこの空白部位に透明な図案や文字層201を印刷している。図案や文字層201はカラーまたは白色で形成しても良い。続いて、金型を利用して地色2と、図案や文字層201が印刷された基材1とを熱圧（ホットプレス）成形によりレター・キー形状の外シェル1'に絞り成型して、最後にこのレター・キー形状の外シェル1'内部に内シェル3'を射出成型してレター・キーのキー・トップを完成する。

【0003】

【発明が解決しようとする課題】上記キー・トップの成型方法は、金型を利用して地色2と、図案や文字層201が印刷された基材1とを熱圧成形によりレター・キー形状の外シェル1'に成型するので、元来基材1に印刷された図案や文字層201が熱圧成形の操作を行う際に変形し易い。この課題の対策として、製作する前に必ずボンチング絞りによって基材1の延伸率を予め計算して、図案や文字層201をそれに応じて予め変形体に印刷し、ボンチングされた変形体が絞り変形して正常の文字や図案になるようにしているが、製作が複雑で品質が安定しないという問題がある。

【0004】上記従来の技術のキー・トップ成型方法における問題点に鑑み、本発明は、基材に印刷された文字や図案が成型によって変形することなく、内シェルと外シェルと基材とが堅固に一体結合して、不良率を低め得ると同時に、生産効率が向上して製造コストを軽減できるキー・トップ成型方法を提供することを目的とする。

【0005】

【課題を解決するための手段】上記目的を達成するた

め、本発明は、a) 文字、図案が印刷され、それぞれ周縁に環状の目打ちを備えた多数の片状素材が形成されているプラスチックシートの基材を予め準備する工程と、b) 固定金型と移動金型とを準備して、この固定金型の両側辺寄りの対称部位にそれぞれセットの外シェル成形キャビティと内シェル成形キャビティとを設け、これら外シェル成形キャビティを前記内シェル成形キャビティよりも大きくし、前記移動金型の各外シェル成形キャビティと各内シェル成形キャビティとが対応する部位にそれぞれセットをなす定位部を設ける工程と、c) 前記移動金型と前記固定金型とを閉じ合せて、前記定位部をそれぞれ前記外シェル成形キャビティの内部と前記内シェル成形キャビティの内部とに位置付け、射出装置によりプラスチック原料を前記内シェル成形キャビティの内部に導入して内シェルを形成する工程と、d) 前記移動金型を前記固定金型から移動して離脱させ、前記内シェルをそのまま定位部に滞留定位させる工程と、e) 前記移動金型を 180 度回転移動して、前記定位部上の前記内シェルを前記外シェル成形キャビティに対応させて、他のセットの定位部を前記内シェル成形キャビティに対応させ、且つ前記基材を前記固定金型の前記外シェル成形キャビティの開口部位に載置させて、各片状素材をそれぞれ各外シェル成形キャビティと各内シェルとに対応させる工程と、f) 前記移動金型を再び前記固定金型に閉じ合せて、この際、前記内シェルが直接前記基材を押圧し、前記片状素材の周縁に目打ちが設けられていることから、前記片状素材が前記内シェルの押圧により押し抜かれて、前記基材と分離して前記外シェル成形キャビティの内部に押し遣られ、前記内シェル周面と前記外シェル成形キャビティ内周面との間に隙間が生ずる工程と、g) 射出装置によりプラスチック原料をそれぞれ前記外シェル成形キャビティと前記内シェル成形キャビティの内部とに注入して、前記隙間内で前記外シェルを形成すると同時に、前記内シェル成形キャビティ内でもう一つの内シェルを形成させ、前記外シェルが前記片状素材と前記内シェルと一体に結合し、前記外シェルの下端縁も前記外シェル成形キャビティの周縁沿いに設けられた凹陥部内の前記基材と一体に結合する工程と、h) 前記移動金型と前記固定金型とを分離して、そのうちのセットの前記定位部からレター・キーのキー・トップ製品を取出し、他方のセットの前記定位部に前記内シェルを滞留定位させる工程と、i) 工程 e) ~ h) を反覆する工程と、を順に行って構成される。

【0006】そして、前記内シェル成形キャビティの奥側端面と内周面との接続部位に多数の突起部を設けて、前記内シェルを成型完了した後に、前記内シェルの上端面に多数の凹み溝を形成し、且つ前記外シェルを成型する際に、プラスチック原料の一部が凹み溝内に流入して多数の結合部を形成し、これにより前記内シェルと前記外シェルとの結合をより強化させるようにしたり、前記

内シェルを透明な材料で形成して、前記片状素材の文字、図案の部位が透明なカラー印刷であり、その他の部分が不透明であるようにしたりすると一層好ましい。

【0007】上記のように構成された本発明は、同一機械設備で内シェル、外シェルを射出成型して、内シェルを利用して直接基材の片状素材を押抜き分離させることができ、且つ外シェルの射出成型の際に、内シェル、外シェル、片状素材、基材を堅固に一体連結できて、同時に外シェル底縁を目打ち部位外側の基材上端面に固結させ得るので、全体構造が牢固なキー・トップを簡単に仕上げることができる。また、片状素材に印刷された文字、図案は、基材が深絞り変形されないで字形なども変形する恐れがなく、従来技術のように製造する前に基材の延伸率を予め計算する必要がない。

【0008】

【発明の実施の形態】以下、本発明を実施の形態に基づいて具体的に説明するが、本発明はこれら実施の形態だけに限定されるものではない。

【0009】まず、第1の実施の形態を図1および2を用いて説明する。

【0010】図1に示すのは、本発明のキー・トップ成型方法における第1の実施の形態であり、その使用する設備は固定金型100と移動金型200とを含み、この固定金型100は下端面の両側にそれぞれ一方が外向き開口のセットである外シェル成形キャビティ110と内シェル成形キャビティ120とが設けられており、外シェル成形キャビティ110の開口面積および深度が内シェル成形キャビティ120のそれよりも大きく、外シェル成形キャビティ110および内シェル成形キャビティ120の側辺にそれぞれ材料注入径路130、140を形成して、外シェル成形キャビティ110の開口周辺に凹陥部150を設ける。一方、移動金型200は上記セットである外シェル成形キャビティ110と内シェル成形キャビティ120とが対応する部位にそれぞれセットの定位部210を装設して、移動金型200のもう一方の面の中央部に回転手段230を延設し、移動金型200を連動して固定金型100に相対して回転できるようにする。

【0011】そして、上記設備を利用して、下記工程を順に行えばレター・キーのキー・トップを成型することができる。

【0012】A. 図1(A)に示すように、予め文字、図案が印刷されたプラスチックシート基材10を準備し、第1の実施の形態ではPC(ポリカーボネート)プラスチック材料を基材10の製作材料とし、文字、図案は一般の印刷技術により基材10のいずれか一方の面に印刷している。そのうちの文字、図案の部位が透明なカラー印刷であり、その他の部位は不透明であり、且つ基材10の文字、図案を設けた部位にそれぞれ片状素材11を形成して、これら片状素材11の周縁に予め複数の

環状の目打ち12を設け、更に後述の材料注入工程と組合せて、片状素材11の周縁の適所に材料注入口13を装設する。

【0013】B. 図1(B)に示すように、移動金型200が固定金型100の設置方向へ移動して互いに閉じ合い、且つ両セットの定位部210をそれぞれ外シェル成形キャビティ110および内シェル成形キャビティ120の内部に位置付けて、射出装置によりプラスチック原料を材料注入径路140から内シェル成形キャビティ120内へ導入して内シェル20を形成する。

【0014】C. 図1(C)に示すように、移動金型200を固定金型100から移動分離させて、内シェル20を定位部210に滞留定位させる。

【0015】D. 図1(D)に示すように、回転手段230を180度駆動回転して、移動金型200を固定金型100に相対して180度回転させ、元来右側にあった内シェル20が滞留している定位部210を左側に移動して、内シェル20を外シェル成形キャビティ110に対応させ、且つ基材10を固定金型100の外シェル成形キャビティ110の凹陷部150内に位置付けて、各片状素材11をそれぞれ各外シェル成形キャビティ110および内シェル20に対応させ、元来左側にあった空の定位部210が右側に回転移動する。

【0016】E. 図1(E)に示すように、移動金型200が固定金型100を設けた方向に移動して互いに閉じ合せ、この際、内シェル20が直接基材10に対して押し抜き操作を行い、上述のように片状素材11の周縁に目打ち12が設けられていることから、片状素材11が内シェル20の押圧により押し抜かれて基材10と分離し、且つ外シェル成形キャビティ110内部に押し遣られて抵触し、内シェル20の周面と外シェル成形キャビティ110の内周面との間に隙間Aが生ずる。

【0017】F. 図1(F)に示すように、射出装置によりプラスチック原料を材料注入径路130、140から外シェル成形キャビティ110および内シェル成形キャビティ120に射出注入して、上記隙間A内で外シェル30を形成し、内シェル成形キャビティ120内でもう一つの内シェル20を形成させる。外シェル30は片状素材と内シェル20と一体に結合でき、外シェル30の下端縁と凹陷部150内の基材10と一体に固結することができる。

【0018】G. 金型を開いて、移動金型200と固定金型100とを分離させ、すなわち、左側の定位部210からレター・キーのキートップ40を取出して、右側の他方の定位部210に内シェル20を残留定位させる(図1(C)が示す状態)。

【0019】H. 工程D~Gを循環反復して大量のキー・トップを生産することができる。

【0020】したがって、この成型方法を利用すれば、同一の成型機械で内シェル20、外シェル30を射出成

型し、内シェル20を利用して直接基材10の片状素材11を押し抜き分離させることができ、且つ外シェル30の射出成型の際に、内シェル20、外シェル30、片状素材11、基材10を堅固に連結させることができる。

図2が示すように、外シェル30の成型により外シェル30の内周面にそれぞれ内シェル20と片状素材11の周縁とを一体に固結し、同時に外シェル30の底縁を目打ち12の外側の基材10の上端面に固結させ得るので、全体構造が牢固なキー・トップに仕上げることもできる。また、片状素材11に印刷された文字、図案は、基材が押圧成形されないので変形する恐れがなく、製作上比較的容易で延伸率を予め計算する必要がない。

【0021】つまり、第1の実施の形態における内シェル20は透明な材質で造られて、基材10も透明な材質で造って良く、且つ片状素材11上に印刷された文字、図案の部位が透明なカラーであり、その他部分是不透明であるので、外シェル30が成型完成すれば、文字、図案の部分が透明であるため、レター・キー構造内に発光手段が設けられていると、内シェル20が透明であることにより、文字、図案をはっきりと表示することができる。

【0022】次に、第2の実施の形態を図3および4を用いて説明する。

【0023】図3および4が示すのは、第2の実施の形態で、内シェル成形キャビティ120'の奥側の端面と内周面との接続部位に多数の突起部160'を設け、内シェル20'を成型完了した後に、内シェル20'の上端面に多数の凹み溝21'を形成して、外シェル30'を成型する際に、部分プラスチック原料を凹み溝21'内に流入させて多数の結合部31'を形成させ、この結合部31'を形成したことにより内シェル20'と外シェル30'の結合をより強化させることができる。

【0024】

【発明の効果】上記の説明から分かるように、成型工程が簡単で、製造が容易な上、文字、図案が変形しないという優れた点があると共に、内シェルと外シェルと基材とを堅固に一体結合して、生産効率を向上させ、且つ製造コストを軽減できる効果がある。

【図面の簡単な説明】

【図1】図1は、第1の実施の形態の成型工程を示す概略図である。

【図2】図2は、第1の実施の形態のレター・キーのキー・トップの側面図である。

【図3】図3は、第2の実施の形態の固定金型と移動金型とが分離した側面図である。

【図4】図4は、第2の実施の形態のレター・キーのキー・トップ側面図である。

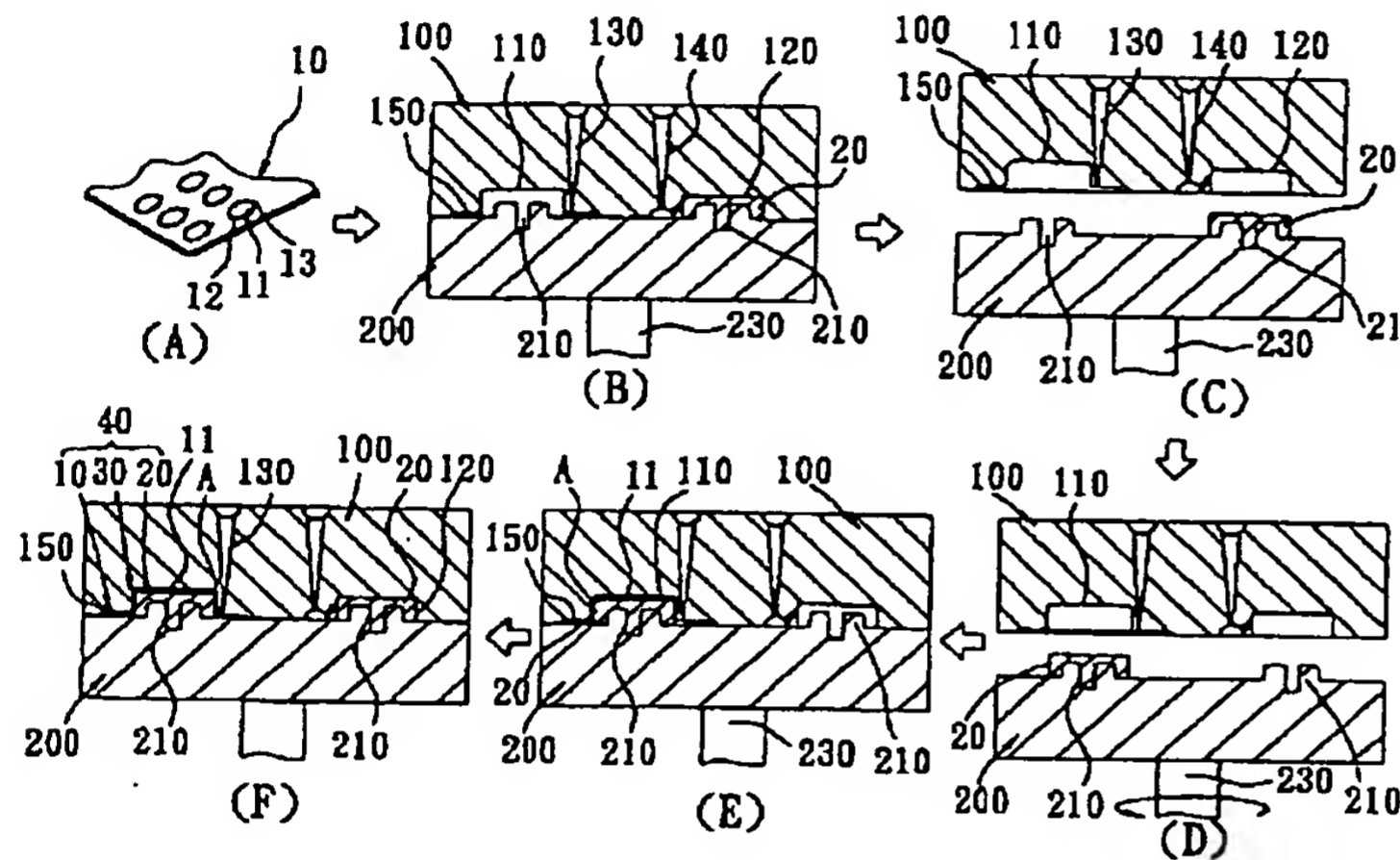
【図5】図5は、従来の技術の一例であるレター・キーのキートップ製造方法によって造られたキー・トップの断面図である。

【符号の説明】

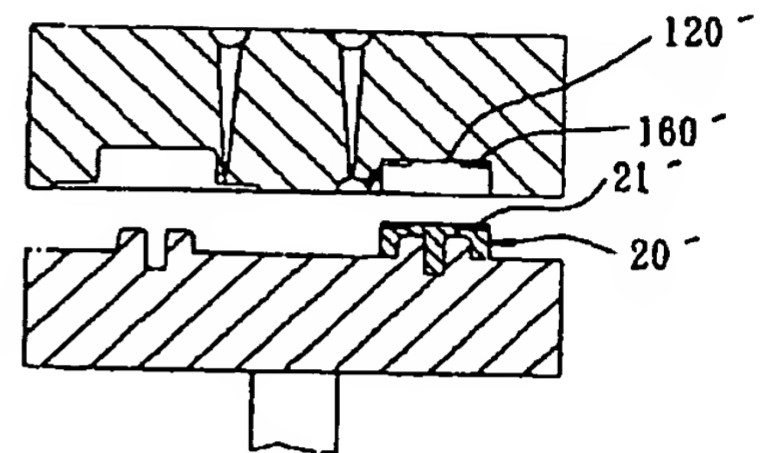
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120…内シェル成形キャビティ、130…材料注入径
路、140…材料注入径路、150…凹陷部、200…
移動金型、210…定位部、230…回転手段、10…*

* 基材、11…片状素材、12…目打ち、13…材料注入
口、20…内シェル、30…外シェル、40…キー・ト
ップ、A…隙間、120'…内シェル成形キャビティ、
160'…突起部、20'…内シェル、21'…凹み
溝、30'…外シェル、31'…結合部

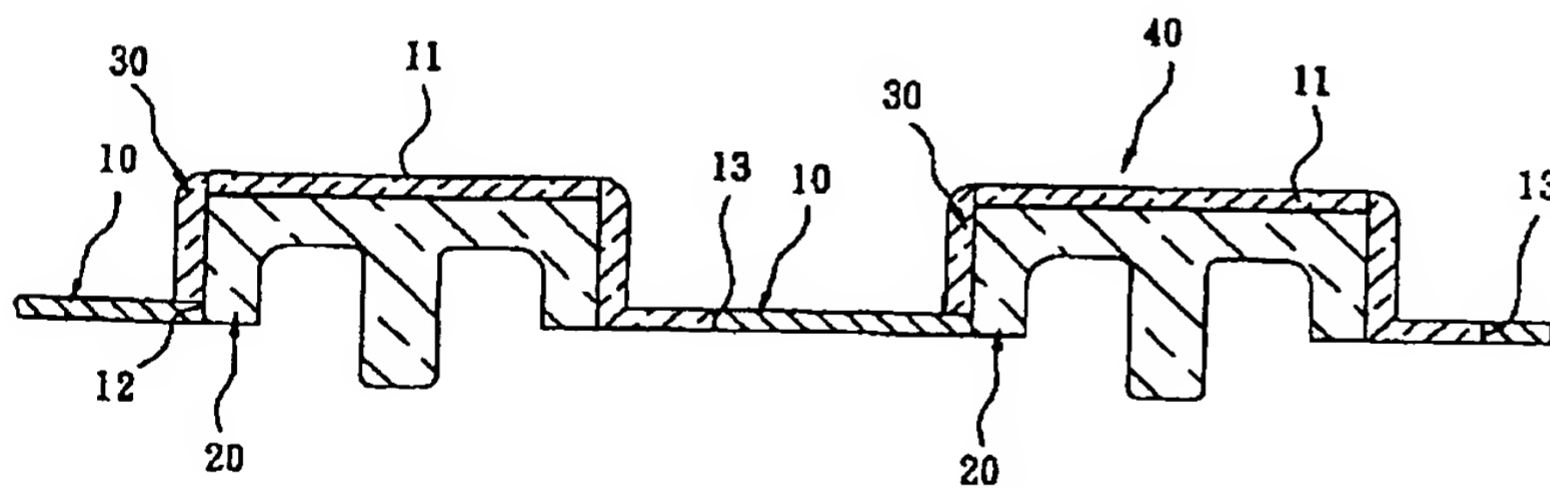
【図1】



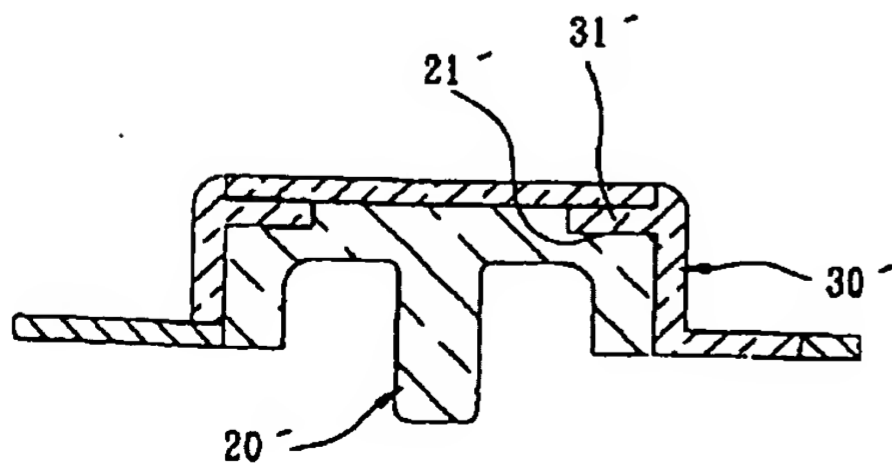
【図3】



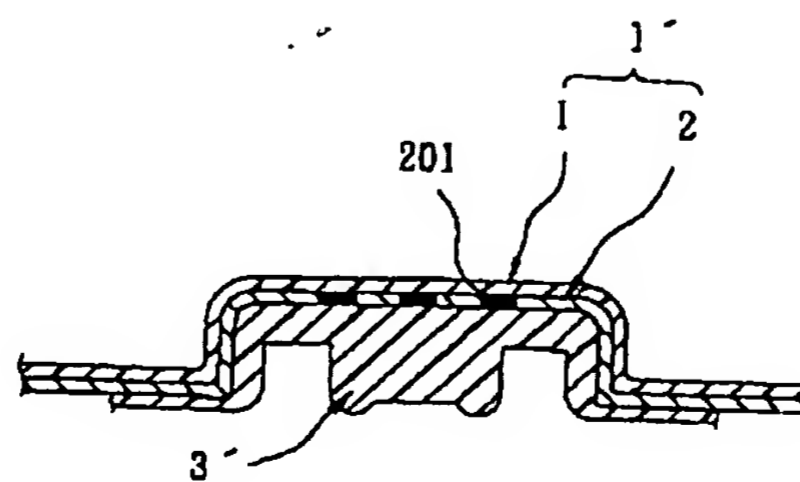
【図2】



【図4】



【図5】



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(51)Int.Cl.

識別記号

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CB01 CB12 CB19 CB27 CC03
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(71)Applicant : SAI KARO

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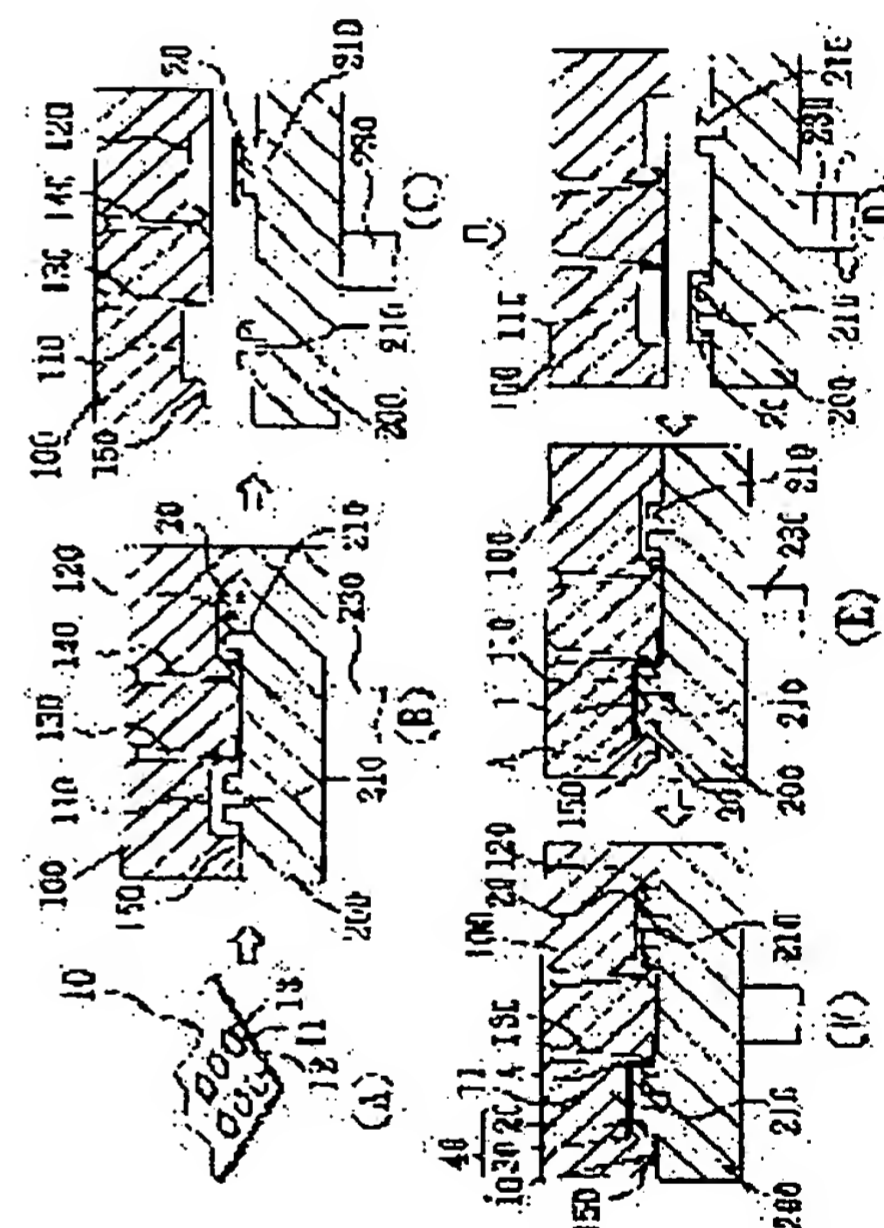
(72)Inventor : SAI KARO

(54) METHOD FOR MOLDING KEY TOP

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a method for molding a key top in which characters and patterns printed on a base material are not deformed by molding.

SOLUTION: The base material 10 having a piece-shaped material 11 on which the characters and the patterns are printed is prepared, a fixed mold 100 and a movable mold 200 are closed, the injection molding of an inner shell 20 is done, the molds are opened, the movable mold 200 are rotated by 180 degrees, the base material 10 is mounted on the opening of an outer shell molding cavity 110 corresponding to the inner shell 20, the movable mold 200 and the fixed mold 100 are closed again, the material 11 is press-cut by the inner shell 20 and retained in the cavity 110, an outer shell 30 is molded by an injection apparatus, the outer shell 30, the inner shell 20, and the material 11 are connected integrally, and the key top 40 of a letter key having the characters and the patterns is finished.



LEGAL STATUS

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[Claim(s)]

[Claim 1] a) The process for which the base material of the sheet plastic with which the piece-like material of a large number which the alphabetic character and the design were printed and equipped the periphery with annular dotting punch, respectively is formed is prepared beforehand, b) Prepare fixed metal mold and migration metal mold, and a shell shaping cavity and an inner shell shaping cavity are prepared in the symmetry part of the both-sides side approach of this fixed metal mold outside a set, respectively. The process which prepares the normal position section set, respectively in the part to which these outside shell shaping cavity is made larger than said inner shell shaping cavity, and each ** shell shaping cavity of said migration metal mold and each ** shell shaping cavity correspond, c) Close said migration metal mold and said fixed metal mold, and said normal position section is positioned at the interior of said outside shell shaping cavity and said inner shell shaping cavity, respectively. The process which introduces a plastics raw material into the inside of said inner shell shaping cavity with injection equipment, and forms inner shell, d) The process which it moves [process], makes said migration metal mold secede from said fixed metal mold, and makes said normal position section carry out the stagnation normal position of said inner shell as it is, e) Rotate said migration metal mold 180 degrees, and said inner shell on said normal position section is made equivalent to said outside shell shaping cavity. Make the normal position section of other sets correspond to said inner shell shaping cavity, and said base material is made to lay in the opening part of a shell shaping cavity outside [said] said fixed metal mold. The process which makes each piece-like material correspond to each ** shell shaping cavity and each ** shell, respectively, f) Close said migration metal mold to said fixed metal mold again, and said inner shell presses said base material directly in this case. Since dotting punch is formed in the periphery of said piece-like material, are kept by pushing said piece-like material press of said inner shell. The process

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which separates with said base material and a clearance produces inside said outside shell shaping cavity between the peripheral surface of push ***** and said inner shell, and the inner skin of said outside shell shaping cavity, g) A plastics raw material is poured into the interior of said outside shell shaping cavity and said inner shell shaping cavity with injection equipment, respectively. Another inner shell is made to form inside said inner shell shaping cavity at the same time it forms outside shell in said clearance. The process which said outside shell combines with said piece-like material, said inner shell, and one, and is combined with said base material and one in the cavity by which the lower limit edge of said outside shell was also established in along the periphery of said outside shell shaping cavity, h) The process which said migration metal mold and said fixed metal mold are separated [process], and makes drawing and said normal position section of other sets carry out the stagnation normal position of said inner shell for the key top product of a letter key from said normal position section of the set of them, i) The key top molding approach of coming in order to carry out the process which repeats said processes e-h.

[Claim 2] Many heights are prepared at least in the articulated section of the back side edge side of said inner shell shaping cavity, and inner skin. After carrying out the completion of molding of said inner shell, many depression slots are formed in the upper limit side of said inner shell. And the key top molding approach according to claim 1 of denting some plastics raw materials, flowing into Mizouchi, forming many bond parts, and making strengthening more and coming to make association with said inner shell and said outside shell by this in case said outside shell is cast.

[Claim 3] Said inner shell is formed with a transparent ingredient, the alphabetic character of said piece-like material and the part of a design are transparent color printings, and they are claim 1 with other opaque parts, or the key top molding approach given in 2.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] Especially this invention relates to various typefaces and the key top molding approach of size about the manufacture approach of a letter key.

[0002]

[Description of the Prior Art] Generally, the key top [the key of a computer keyboard, the number key of telephone, or actuation key / of a computer / —] attaches an alphabetic character, a notation, and a design, respectively, and he is planning so that

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conveniently [discernment or actuation]. The key top molding approach (Taiwan chiefly Toshikimi **** No. 311116) of the conventional example is made into a null, and leaves the part which prints the ground color 2 deep at the tooth back of a base material 1 first, and prints a design and an alphabetic character layer as shown in drawing 5 , and then the transparent design and the alphabetic character layer 201 are printed to this null part. A design and the alphabetic character layer 201 may be formed in a color or white. Then, using metal mold, a ground color 2 and the base material 1 with which the design and the alphabetic character layer 201 were printed are extracted to shell 1' outside a letter key configuration with heat-and-pressure (hotpress) shaping, are cast, finally the injection molding of inner shell 3' is carried out to the interior of shell 1' outside this letter key configuration, and the key top of a letter key is completed.

[0003]

[Problem(s) to be Solved by the Invention] Since the above-mentioned key top's molding approach casts a ground color 2 and the base material 1 with which the design and the alphabetic character layer 201 were printed to shell 1' outside a letter key configuration by interweaving by heating under pressure using metal mold, in case it operates interweaving of the design and the alphabetic character layer 201 which were originally printed by the base material 1 by heating under pressure, it is easy to deform. Although the rate of extension of a base material 1 is calculated beforehand, the plasmodium by which punching was beforehand printed and carried out to the plasmodium according to it extracts and deforms a design and the alphabetic character layer 201 and he is trying to surely become a normal alphabetic character and a normal design according to a punching diaphragm as a cure of this technical problem before manufacturing, there is a problem that manufacture is complicated and quality is not stabilized.

[0004] While inner shell, outside shell, and a base material really join together strongly and can lower a percent defective, without the alphabetic character and the design which this invention was printed by the base material in view of the trouble in the key top molding approach of the above-mentioned Prior art deforming by molding, it aims at offering the key top molding approach which productive efficiency improves and can mitigate a manufacturing cost.

[0005]

[Means for Solving the Problem] The process which, as for this invention, the a alphabetic character and a design prepare the base material of the sheet plastic with

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which the piece-like material of a large number which were printed and equipped the periphery with annular dotting punch, respectively is formed beforehand in order to attain the above-mentioned purpose, b) Prepare fixed metal mold and migration metal mold, and a shell shaping cavity and an inner shell shaping cavity are prepared in the symmetry part of the both-sides side approach of this fixed metal mold outside a set, respectively. The process which prepares the normal position section set, respectively in the part to which these outside shell shaping cavity is made larger than said inner shell shaping cavity, and each ** shell shaping cavity of said migration metal mold and each ** shell shaping cavity correspond, c) Close said migration metal mold and said fixed metal mold, and said normal position section is positioned at the interior of said outside shell shaping cavity and said inner shell shaping cavity, respectively. The process which introduces a plastics raw material into the interior of said inner shell shaping cavity with injection equipment, and forms inner shell, d) The process which it moves [process], makes said migration metal mold secede from said fixed metal mold, and makes the normal position section carry out the stagnation normal position of said inner shell as it is, e) Rotate said migration metal mold 180 degrees, and said inner shell on said normal position section is made equivalent to said outside shell shaping cavity. Make the normal position section of other sets correspond to said inner shell shaping cavity, and said base material is made to lay in the opening part of a shell shaping cavity outside [said] said fixed metal mold. The process which makes each piece-like material correspond to each ** shell shaping cavity and each ** shell, respectively, f) Close said migration metal mold to said fixed metal mold again, and said inner shell presses said base material directly in this case. Since dotting punch is formed in the periphery of said piece-like material, are kept by pushing said piece-like material press of said inner shell. The process which separates with said base material and a clearance produces inside said outside shell shaping cavity between push *****, said inner shell peripheral surface, and said outside shell shaping cavity inner skin, g) A plastics raw material is poured into the interior of said outside shell shaping cavity and said inner shell shaping cavity with injection equipment, respectively. Another inner shell is made to form within said inner shell shaping cavity at the same time it forms said outside shell in said clearance. The process which said outside shell combines with said piece-like material, said inner shell, and one, and is combined with said base material and one in the cavity by which the lower limit edge of said outside shell was also established in along the periphery of said outside shell shaping cavity, h) Said migration metal mold and said fixed metal

mold are separated, and the process which makes drawing and said normal position section of the set of another side carry out the stagnation normal position of said inner shell for the key top product of a letter key, and the process which repeats the i processes e-h are performed in order, and it consists of said normal position sections of the set of them.

[0006] And many heights are prepared at least in the articulated section of the back side edge side of said inner shell shaping cavity, and inner skin. After carrying out the completion of molding of said inner shell, many depression slots are formed in the upper limit side of said inner shell. And in case said outside shell is cast, dent some plastics raw materials, flow into Mizouchi, and many bond parts are formed. It is made to make association with said inner shell and said outside shell strengthen more by this, or said inner shell is formed with a transparent ingredient, the alphabetic character of said piece-like material and the part of a design are transparent color printings, other parts are opaque, and when it has made enough and carries out, it is much more desirable.

[0007] This invention constituted as mentioned above carries out the injection molding of inner shell and the outside shell by the same machine. Punching separation of the piece-like material of a direct base material can be carried out using inner shell. And since inner shell, outside shell, a piece-like material, and a base material can really be strongly connected in the case of the injection molding of outside shell and coincidence may be made to join an outside shell bottom edge with it to the base material upper limit side of a dotting punch part outside, whole structure can finish the firm key top easily. Moreover, since deep-drawing deformation of the base material is not carried out, before the alphabetic character and design which were printed by the piece-like material not having a possibility that a typeface etc. may deform and manufacturing them like the conventional technique, they do not need to calculate the rate of extension of a base material beforehand.

[0008]

[Embodiment of the Invention] Hereafter, although this invention is concretely explained based on the gestalt of operation, this invention is not limited only to the gestalt of these operations.

[0009] First, the gestalt of the 1st operation is explained using drawing 1 and 2.

[0010] It is the gestalt of the 1st operation in the key top molding approach of this invention which is shown in drawing 1 . On the other hand, the outside shell shaping cavity 110 and the inner shell shaping cavity 120 which are the set of outward opening

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are prepared. that facility to be used -- the fixed metal mold 100 and the migration metal mold 200 -- containing -- this fixed metal mold 100 -- the both sides of a lower limit side -- respectively -- The opening area and depth of the outside shell shaping cavity 110 are larger than that of the inner shell shaping cavity 120. The ingredient impregnation trajectories 130 and 140 are formed, respectively the side side of the outside shell shaping cavity 110 and the inner shell shaping cavity 120, and a cavity 150 is formed on the outskirts of opening of the outside shell shaping cavity 110. The migration metal mold 200 decorates with the normal position section 210 of a set the part to which the outside shell shaping cavity 110 and the inner shell shaping cavity 120 which are the above-mentioned set correspond, respectively, installs the rotation means 230 in the center section of another field of the migration metal mold 200, it interlocks, faces the fixed metal mold 100, and enables it to, rotate the migration metal mold 200 on the other hand.

[0011] And using the above-mentioned facility, if the following process is performed in order, the key top of a letter key can be cast.

[0012] A. As shown in drawing 1 (A), an alphabetic character and the sheet-plastic base material 10 with which the design was printed are prepared beforehand, with the gestalt of the 1st operation, PC (polycarbonate) plastic material is used as the manufacture ingredient of a base material 10, and the alphabetic character and the design are printed to one field of the base materials 10 with the general printing technique. The alphabetic character of them and the part of a design are transparent color printings, and other parts are opaque, and form the piece-like material 11 in the part in which the alphabetic character of a base material 10 and the design were prepared, respectively, form two or more annular dotting punch 12 in the periphery of the these piece-like material 11 beforehand, and decorate the proper place of the periphery of the piece-like material 11 with the ingredient inlet 13 combining the further below-mentioned ingredient impregnation process.

[0013] B. As shown in drawing 1 (B), the migration metal mold 200 moves in the installation direction of the fixed metal mold 100, and it closes each other, and position the normal position section 210 of both sets in the interior of the outside shell shaping cavity 110 and the inner shell shaping cavity 120, respectively, introduce a plastics raw material into the inner shell shaping cavity 120 from the ingredient impregnation trajectory 140 with injection equipment, and form the inner shell 20.

[0014] C. Carry out migration separation of the migration metal mold 200 from the fixed metal mold 100, and make the normal position section 210 carry out the

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stagnation normal position of the inner shell 20, as shown in drawing 1 (C).

[0015] D. As shown in drawing 1 (D), carry out drive rotation of the rotation means 230 180 degrees. Face the fixed metal mold 100, rotate the migration metal mold 200 180 degrees, and the normal position section 210 in which the inner shell 20 which was in right-hand side originally is piling up is moved to left-hand side. Make the inner shell 20 equivalent to the outside shell shaping cavity 110, and a base material 10 is positioned in the cavity 150 of the shell shaping cavity 110 outside the fixed metal mold 100. Each piece-like material 11 is made to correspond to each ** shell shaping cavity 110 and the inner shell 20, respectively, and the normal position section 210 of the empty originally located on left-hand side rotates on right-hand side.

[0016] E. As shown in drawing 1 (E), the migration metal mold 200 moves in the direction in which the fixed metal mold 100 was formed, and close mutually. Under the present circumstances, the inner shell 20 performs punching actuation to the direct base material 10. From dotting punch 12 being formed in the periphery of the piece-like material 11 as mentioned above It is kept by pushing the piece-like material 11 press of the inner shell 20, and dissociates with a base material 10, and it pushes on the outside shell shaping cavity 110 interior, ***** contradiction is carried out, and Clearance A is generated between the peripheral surface of the inner shell 20, and the inner skin of the outside shell shaping cavity 110.

[0017] F. Carry out injection impregnation of the plastics raw material from the ingredient impregnation trajectories 130 and 140 with injection equipment at the outside shell shaping cavity 110 and the inner shell shaping cavity 120, form the outside shell 30 in the above-mentioned clearance A, and make another inner shell 20 form within the inner shell shaping cavity 120, as shown in drawing 1 (F). It can combine with a piece-like material, the inner shell 20, and one, and the outside shell 30 can be joined with the lower limit edge of the outside shell 30, the base material 10 in a cavity 150, and one.

[0018] G. Open metal mold, and make the migration metal mold 200 and the fixed metal mold 100 separate, namely, take out the keytop 40 of a letter key from the left-hand side normal position section 210, and make the normal position section 210 of right-hand side another side carry out the residual normal position of the inner shell 20 (condition which drawing 1 (C) shows).

[0019] H. Process D-G can be carried out repeatedly [circulation], and a lot of key top can be produced.

[0020] Therefore, the injection molding of the inner shell 20 and the outside shell 30

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can be carried out by the same shaping machine, punching separation of the piece-like material 11 of the direct base material 10 can be carried out using the inner shell 20, and in case it is injection molding of the outside shell 30, the inner shell 20, the outside shell 30, the piece-like material 11, and a base material 10 can be made to connect strongly, if this molding approach is used. Since the inner shell 20 and the periphery of the piece-like material 11 are joined with the inner skin of the outside shell 30 by molding of the outside shell 30 at one, respectively and the upper limit side of the base material 10 of the outside of dotting punch 12 may be made to join the bottom edge of the outside shell 30 with coincidence as drawing 2 shows, whole structure can make the firm key top. Moreover, the alphabetic character and design which were printed by the piece-like material 11 do not have a possibility of deforming since press shaping of the base material is not carried out, are comparatively easy on manufacture and do not need to calculate the rate of extension beforehand.

[0021] That is, since the part of the alphabetic character which the inner shell 20 in the gestalt of the 1st operation was built with the transparent quality of the material, and could also build the base material 10 with the transparent quality of the material, and was printed on the piece-like material 11, and a design is a transparent color, in addition the part is opaque. If the outside shell 30 carries out molding completion, since the parts of an alphabetic character and a design are transparent, if the luminescence means is established in letter key structure, an alphabetic character and a design can be clearly displayed according to the inner shell 20 being transparent.

[0022] Next, the gestalt of the 2nd operation is explained using drawing 3 and 4.

[0023] It is the gestalt of the 2nd operation which drawing 3 and 4 show, and it prepares much height 160' at least in the articulated section of the end face by the side of the back of inner shell shaping cavity 120', and inner skin. After carrying out the completion of molding of inner shell 20', much depression slot 21' is formed in the upper limit side of inner shell 20'. the time of casting outside shell 30' — a partial plastics raw material — denting — slot 21' — association of inner shell 20' and outside shell 30' can be made to strengthen more by having made it flow inside, having made much bond part 31' form, and having formed this bond part 31'

[0024]

[Effect of the Invention] While a molding process is easy and there is an outstanding point that an alphabetic character and a design do not deform the top where manufacture is easy so that the above-mentioned explanation may show, there is effectiveness which inner shell, outside shell, and a base material are really combined

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strongly, and productive efficiency is raised, and can mitigate a manufacturing cost.

[Brief Description of the Drawings]

[Drawing 1] Drawing 1 is the schematic diagram showing the molding process of the gestalt of the 1st operation.

[Drawing 2] Drawing 2 is the side elevation of the key top of the letter key of the gestalt of the 1st operation.

[Drawing 3] Drawing 3 is the side elevation which the fixed metal mold and migration metal mold of a gestalt of the 2nd operation separated.

[Drawing 4] Drawing 4 is the key top side elevation of the letter key of the gestalt of the 2nd operation.

[Drawing 5] Drawing 5 is the key top's sectional view built by the keytop manufacture approach of the letter key which is an example of a Prior art.

[Description of Notations]

100 — Fixed metal mold, 110 — An outside shell shaping cavity, 120 — Inside shell shaping cavity, 130 [— Migration metal mold,] — An ingredient impregnation trajectory, 140 — An ingredient impregnation trajectory, 150 — A cavity, 200 210 [— Piece-like material,] — The normal position section, 230 — A rotation means, 10 — A base material, 11 12 — dotting punch, 13 — ingredients inlet, the shell in 20 —, and 30 — outside shell, 40 — key top, A — clearance, and 120 — 'the shell shaping cavity in —, and 160' — height and 20 — 'the shell in —, the shell outside 21' — depression slot and 30' —, and 31' — bond part

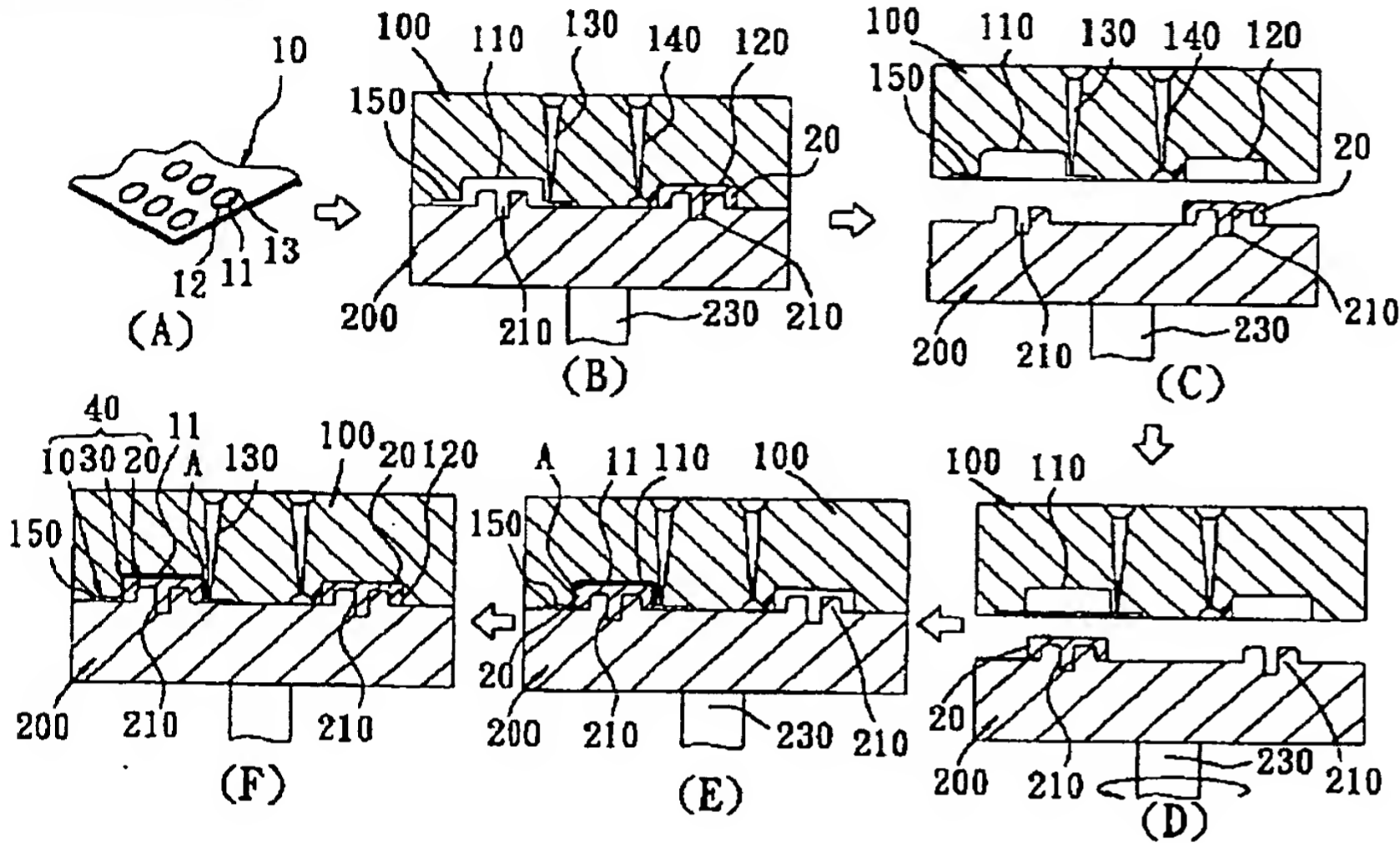
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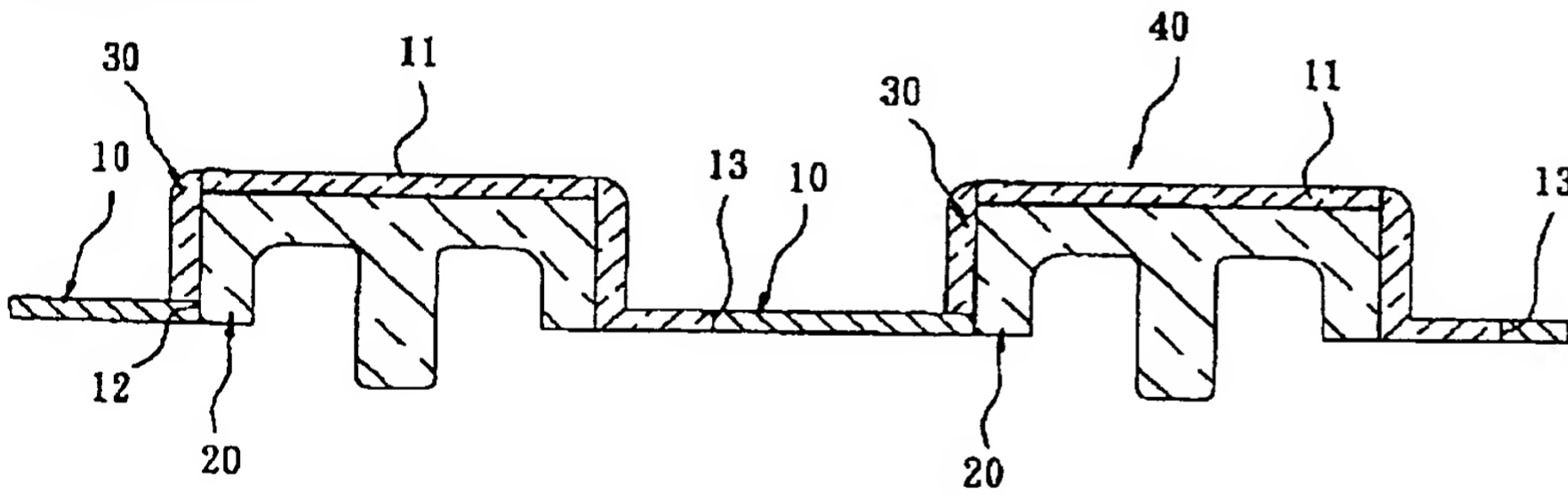
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DRAWINGS

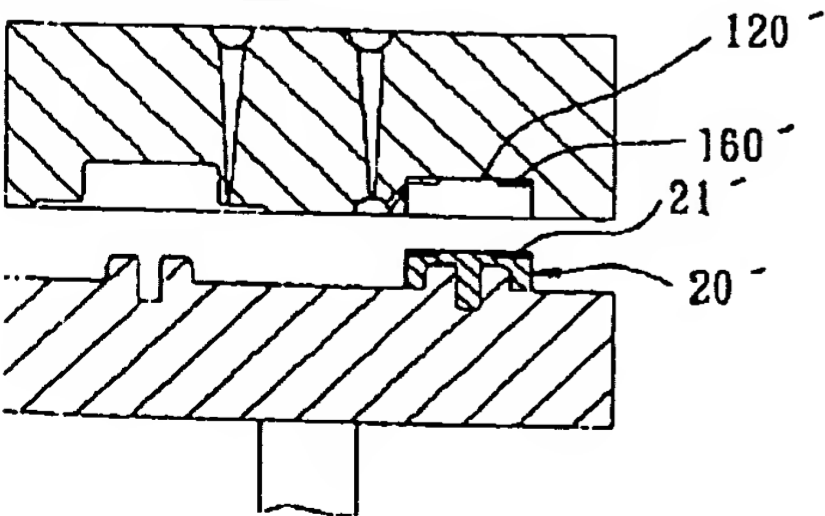
[Drawing 1]



[Drawing 2]

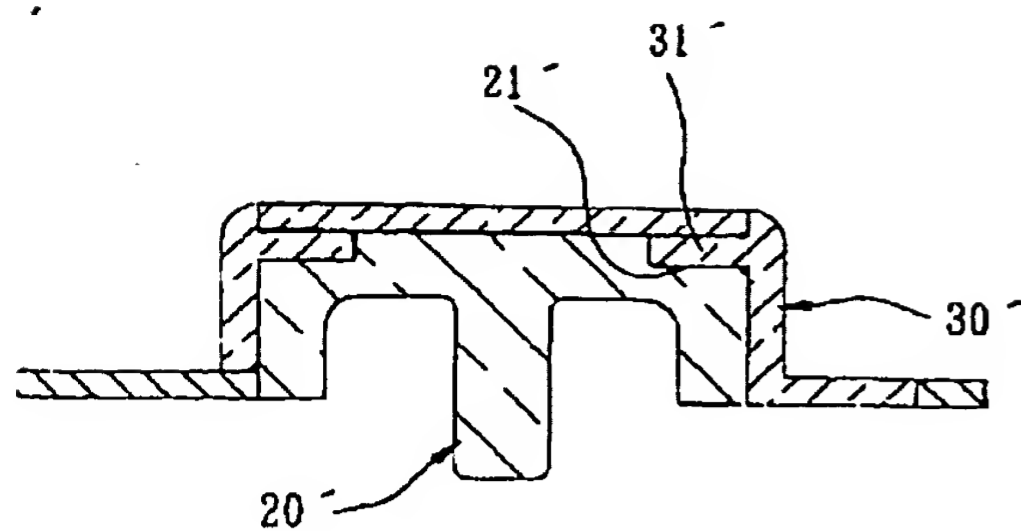


[Drawing 3]

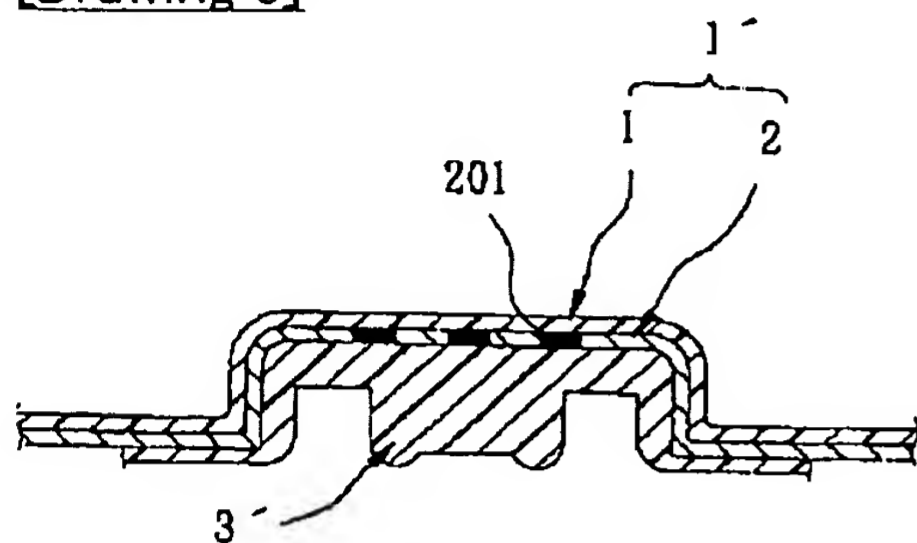


[Drawing 4]

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[Drawing 5]



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